



Goals of the WSA Program

Produce a report on the condition of wadeable streams of the U.S. by December 2005

Promote collaboration across jurisdictional boundaries in the examination and assessment of water quality

Build State capacity through use of survey design and comparability of methods or indicators.

Process to Examine Comparability of Biological Methods

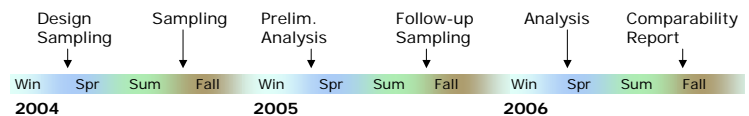
Purpose

The purpose of the comparability studies is to help address the question of whether data collected using different biological methods can be combined to assess condition. These studies will ascertain similarities and differences among biological methods and the data, indicators, and assessment results derived from those methods. Ultimately, the ability to aggregate assessment information from different methods will enhance regional or broader scale assessments.

Primary Questions

A rigorous sampling design is used that evaluates the different methods over both natural and stressor gradients and reference sites. To what extent are the state methods and WSA method comparable for:

- Data?
- Indicators?
- Assessments?



Background

Timeline for Comparability Studies

- Each state has its own SOPs, which specify the process for sample collection (including reach designations and timing of sampling), sample processing (e.g., sorting), taxonomic methods, and data analysis and reporting (e.g., assessment process). These state methods differ to varying degrees with each other and with those being used in WSA.
- A performance-based system (PBS) approach to methods and monitoring is recommended, in part, because it specifies documenting data quality (NWQMC, 2001).
- It is desirable to document relevant **performance characteristics** of each method and evaluate the overall variability inherent in the method.

Performance characteristics

- Method precision and sensitivity should be documented by using measurement endpoints used by the state in its assessments.
- **Precision** is a function of the repeatability of a given endpoint, given the sampling and sample processing methods used.
- **Sensitivity** is analogous to a chemical detection limit and is a function of both precision and responsiveness of the endpoint to perturbation.

Data and Assessment Comparability Determinations

- Biological methods comparability should be viewed on both **data** and **assessment** (or **endpoint**) levels.
- EPA and interstate agencies conduct **assessments** of ecological conditions at regional and national scales.
- Comparability of assessments between a state method and WSA has to be carefully defined because of the different scales (i.e., statewide versus regional/national); the purpose of WSA is to extrapolate condition independent of jurisdictional boundaries.
- Ecological **data** are collected by different entities within a state and aggregation of these data can be beneficial in a state's program.

Data vs. Assessment Comparability Determinations, continued...

1. If methods are comparable at the data level, then...

- Results of the state's monitoring program at reference sites can be used to help define reference condition and thresholds for interpreting the WSA data set.
- WSA results can be used by states to supplement their data. The inverse is also true – If a state uses a probability design, its data can be used in the WSA analyses.
- The states and EPA would have access to a larger pool of data within and among states.
- Comparability between and among methods increases the defensibility of the methods.

➤ If the data *aren't* comparable, the states will be able to avoid the error of combining dissimilar data.

2. If the methods are comparable at the assessment or endpoint level, then...

- Defensibility of assessments is enhanced for the states and results are more robust.
- States can use the BCG framework as a means of documenting comparability of different methods and cross-calibration of results.

➤ If *endpoints* are comparable but *assessments* are not, the states will have a way to adjust for differences in assessment.



Sampling Design

- ✎ **Sampling Array** – Minimum of 20 sites distributed across environmental gradient and disturbance gradient.
- ✎ **Reach Selection** – A well-defined stream segment (i.e., between two confluences) with no major water quality changes within the reach (i.e., a large discharge at the midpoint).
- ✎ **Sampling Guidelines** – Strict adherence to the SOPs and quality control procedures is required to minimize sampling bias.

Analysis Design

- ✎ **Precision** – Replicate sampling is done for each method to evaluate monitoring in precision along the gradients.
- ✎ **Sensitivity** – Reference sites used to establish benchmarks for evaluating detection of disturbance for the various methods.
- ✎ **Similarity in Indicators** – Comparison of assemblage attributes from data is done to evaluate the similarity in indicators via each method.



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